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What is claimed is:

1 1. A method for estimating the
2 displacement of at least one object with respect to
3 a first image and a second image, wherein the
4 object is fixed within each of the first image and
5 the second image, the method comprising:
6 generating a plurality of search regions
7 within said second image based on a plurality of
8 search parameters;
9 determining an object displacement
10 estimate for each of the search regions;
11 measuring the validity of each of the
12 plurality of estimated object displacements;
13 comparing the validity measurements to
14 determine the best object displacement estimate;
15 wherein the best object displacement
16 estimate
17 corresponds to the displacement of the object.

1 2. A method as defined in Claim 1
2 wherein the search parameters are selected from the
3 group that consists of search region dimensions,
4 motion model trajectory, search range and step
5 size.

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1 3. A method as defined in Claim 2
2 wherein generating a plurality of search regions
3 comprises:
4 selecting a range of displacement of the
5 object;
6 selecting step size for traversing the
7 range within the second image; and
8 determining a plurality of search regions
9 within the second image based upon step size and
10 selected range of displacement.

1 4. A method as defined in Claim 2
2 further including:
3 comparing each of said measurements of
4 validity to a cutoff value;
5 selecting at least one new search
6 parameter in the event that none of the
7 measurements of validity exceeds the cutoff value;
8 determining apparent displacement in
9 accordance with the at least one new parameter.

1 5. A method as defined in Claim 1
2 wherein the search regions are related to one
3 another.

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1 6. A method as defined in Claim 5
2 wherein the search regions are related to one
3 another by a preselected motion model.

1 7. A method as defined in Claim 2 wherein
2 the number of search regions is related to step
3 size.

1 8. A method as defined in Claim 1
2 wherein adjacent search regions include overlapping
3 areas.

1 9. A method as defined in Claim 1
2 wherein determining an object displacement
3 estimate further comprises performing a
4 multiresolution analysis.

1 10. A method as defined in Claim 1
2 wherein determining an object displacement estimate
3 further comprises performing an optical flow
4 analysis.

1 11. A method as defined in Claim 1
2 wherein measuring validity further comprises
3 performing an image reconstruction and correlation
4 analysis.

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1 12. A method as defined in Claim 1
2 wherein measuring validity further comprises
3 performing a residual error analysis.

1 13. A system for estimating the
2 displacement of at least one object with respect to
3 a first image and a second image, wherein the
4 object is fixed within each of the first image and
5 the second image, the system comprising, in
6 combination:

7 a) a search region generator adapted to
8 receive the first and second images and selected
9 search parameters as inputs and to provide a
10 plurality of search regions in response;

11 b) an object displacement estimator
12 adapted to receive the plurality of search regions
13 and to provide a plurality of object displacement
14 estimates in response;

15 c) a validity measurer adapted to receive
16 the plurality of object displacement estimates and
17 to provide a plurality of validity measurements in
18 response; and

19 d) a validity comparator adapted to
20 receive the plurality of validity measurements and
21 to provide a best object displacement estimate in
22 response.

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1 14. A system as defined in Claim 13
2 wherein:

3 a) the search parameters include search
4 range and step size; and

5 b) the search region generator is
6 arranged to determine the plurality of search
7 regions within the second image based upon the step
8 size and the selected range of displacement.

1 15. A system as defined in Claim 13
2 wherein the validity comparator is arranged to
3 compare each of the validity measurements to a
4 predetermined cutoff value.

1 16. A system as defined in Claim 15
2 wherein the validity comparator is arranged to
3 determine the best validity measurement that
4 exceeds the predetermined cutoff value.

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1 17. Apparatus for estimating the
2 displacement of at least one object with respect to
3 a first image and a second image, wherein the
4 object is fixed within each of the first image and
5 the second image comprising, in combination:

6 a) means for generating a plurality of
7 search regions within the second image based on
8 selected search parameters;

9 b) means for determining an object
10 displacement estimate for each of the search
11 regions;

12 c) means for measuring the validity of
13 each of the plurality of estimated object
14 displacements;

15 d) means for comparing the validity
16 measurement to determine a best object displacement
17 estimate.